2018-19

QUALITY CONTROL REPORTS

Name of the Client: **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency: **Sri. B.B. Umesh,** Contractor, Bangalore.

Name of the Work: Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

PROJECT MANAGEMENT CONSULTANTS

M/s. CIVIL QUALITY CONSULTANTS & ENGINEERS

(Buildings Geo-Tech & Road Materials Testing Laboratory)
NABL Accredited As per ISO/IEC: 17025:2005 Laboratory

#133, Bhuvaneshwarinagar, Dodda Basti Main Road, Bangalore-560056
e-mail: civilqualityconsultants@gmail.com Ph: 8553518550/9886998316

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CIVIL QUALITY CONSULTANTS & ENGINEERS

(Buildings Geo-Tech & Highway Materials Testing Laboratory)
An ISO 9001: 2008 Certified Company

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date: 04.07.2018

TEST REPORT

CLIENT	:	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
AGENCY	:	**Sri. B.B. Umesh,** Contractor, Bangalore.
NAME OF THE WORK	:	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
SAMPLE ID	:	Cement
SAMPLES SUPPLIED BY	:	AGENCY

The results of the tests conducted on the cement sample are as follows:

Sl.No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 12269-1987
1	a) Initial Setting Time	IS-4031 (Part -5)	140 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5)	410 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part 3) by the Le-Chatelier method	1 mm	Not more than 10 mm
3	Standard Consistency	IS-4031 (Part -4)	28.50 %	-

Note:

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Authorised Signatory

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date : 04.07.2018

TEST REPORT ON FINE AGGREGATES (SAND)
IS 383-1970 (RA- 2002)

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **Sri. B.B. Umesh,** Contractor, Bangalore.

Name of Work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Date of Testing : 04.07.2018

Material : Sand Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits For Zone-II
10	0	0	0	100	100
4.75	89	8.90	8.90	91.1	90-100
2.36	140	14.00	22.90	77.1	75-100
1.18	158	15.80	38.70	61.3	55-90
600 Micron	189	18.90	57.60	42.4	35-59
300 Micron	268	26.80	84.40	15.6	8-30
150 Micron	140	14.00	98.40	1.6	0-10

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date : 04.07.2018

TEST REPORT ON COARSE AGGREGATES
IS 383-1970 (RA- 2002)

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **Sri. B.B. Umesh,** Contractor, Bangalore.

Name of Work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Date of Testing : 04.07.2018

Material : 40mm Aggregates

Total Wt. of Aggregates in gms **15000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits
80	0	0	0	100	100
40	584	3.89	3.89	96.11	95-100
20	5569	37.13	41.02	58.98	30-70
10	4350	29.00	70.02	29.98	10-35
4.75	3864	25.76	95.78	4.22	0-5

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date : 04.07.2018

TEST REPORT ON COARSE AGGREGATES
IS 383-1970 (RA- 2002)

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **Sri. B.B. Umesh,** Contractor, Bangalore.

Name of Work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Date of Testing : 04.07.2018

Material : 20mm Aggregates

Total Wt. of Aggregates in gms= **5000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits
40	0	0	0	100	100
20	189	3.8	3.8	96.2	95-100
10	3465	69.3	73.1	26.9	25-55
4.75	1120	22.4	95.5	4.5	0-10

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date: 19.07.2018

TEST REPORT ON CONCRETE CUBES

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Contractor : **Sri. B.B. Umesh,** Contractor, Bangalore.

Name of the work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{15}

Compressive Strength as on : 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	12.07.2018	19.07.2018	8.142	268.9	11.95
2	12.07.2018	19.07.2018	8.138	255.6	11.36
3	12.07.2018	19.07.2018	8.120	275.1	12.23

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date: 09.08.2018

TEST REPORT ON CONCRETE CUBES

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Contractor : **Sri. B.B. Umesh,** Contractor, Bangalore.
Name of the work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Sample ID : Cement Concrete
Size of cubes : 150mmx150mmx150mm
Cross Sectional Area : 22500 mm^2
Technical Reference : IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete : M_{15}
Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	12.07.2018	09.08.2018	8.169	398.6	17.72
2	12.07.2018	09.08.2018	8.182	408.2	18.14
3	12.07.2018	09.08.2018	8.192	389.1	17.29

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Job No.: CQCE/BBMP/BBU/QC/2018-19 21.07.2018

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **Sri. B.B. Umesh,** Contractor, Bangalore.

Name of the work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{30}

Compressive Strength as on : 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	14.07.2018	21.07.2018	8.323	488.6	21.72
2	14.07.2018	21.07.2018	8.341	512.3	22.77
3	14.07.2018	21.07.2018	8.357	534.7	23.76

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Job No.: CQCE/BBMP/BBU/QC/2018-19 11.08.2018

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

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Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{30}

Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	14.07.2018	11.08.2018	8.427	738.4	32.82
2	14.07.2018	11.08.2018	8.468	721.5	32.07
3	14.07.2018	11.08.2018	8.453	708.3	31.48

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Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{30}

Compressive Strength as on : 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	14.07.2018	21.07.2018	8.331	477.2	21.21
2	14.07.2018	21.07.2018	8.348	497.9	22.13
3	14.07.2018	21.07.2018	8.357	521.3	23.17

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Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{30}

Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	14.07.2018	11.08.2018	8.432	741.2	32.94
2	14.07.2018	11.08.2018	8.457	724.3	32.19
3	14.07.2018	11.08.2018	8.448	706.5	31.40

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Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{30}

Compressive Strength as on : 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	14.07.2018	21.07.2018	8.322	476.2	21.16
2	14.07.2018	21.07.2018	8.354	492.5	21.89
3	14.07.2018	21.07.2018	8.367	512.3	22.77

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TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
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Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{30}
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	14.07.2018	11.08.2018	8.452	751.8	33.41
2	14.07.2018	11.08.2018	8.467	708.3	31.48
3	14.07.2018	11.08.2018	8.429	727.6	32.34

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Job No.: CQCE/BBMP/BBU/QC/2018-19 20.07.2018

TEST REPORT ON CHAIN LINK FENCING WIRE (8th Gauge)

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **Sri. B.B. Umesh,** Contractor, Bangalore.

Name of work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Samples ID : Samples Supplied By Agency

Sl.No	Description	Result
1	Diameter	4.32 mm
2	Internal Spacing	50 mm X 50 mm
3	Weight / Meter (1m x 1m)	4.456 Kg

The Results relate only to the items tested

Note:

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Job No.: CQCE/BBMP/BBU/QC/2018-19 20.07.2018

TEST REPORT ON STRUCTURAL STEEL

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **Sri. B.B. Umesh,** Contractor, Bangalore.

Name of work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Samples ID : Samples Supplied By Agency

Specimen Size : ISA-65X65X6mm (1m Length)

Sl.No	Description	Result
1	Thickness	6.25 mm
2	Width	65.9 mm
3	Weight / Meter	5.38 Kg

The Results relate only to the items tested

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ISO 9001:2000 CERTIFIED

Job No.: CQCE/BBMP/BBU/QC/2018-19 20.07.2018

TEST REPORT ON M.S PIPE (38mm Dia)

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **Sri. B.B. Umesh,** Contractor, Bangalore.

Name of work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Specimen Size : M.S Pipe 38mm Dia

PHYSICAL TEST

Sl.No	Description	Result
1	Thickness	2.34 mm
2	Inner Diameter	38.42 mm
3	Outer Diameter	42.56 mm
4	Weight / Meter	1.885 kg

The Results relate only to the items tested

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date : 28.07.2018

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **Sri. B.B. Umesh,** Contractor, Bangalore.

Name of Work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Date of Testing : 28.07.2018

Material Type : Wet Mix Macadam

Oven Dry Wt (gm): **10000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	261	261	2.6	97.4	95-100
22.4	2514	2775	27.8	72.3	60-80
11.2	2782	5557	55.6	44.4	40-60
4.75	1564	7121	71.2	28.8	25-40
2.36	1178	8299	83.0	17.0	15-30
0.600	398	8697	87.0	13.0	8-22
0.075	623	9320	93.2	6.8	0-8

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date : 28.07.2018

GRADATION FOR WMM
MORTH TABLE-400-11

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Date of Testing : 28.07.2018

Material Type : Wet Mix Macadam

Oven Dry Wt (gm): **10000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	258	258	2.6	97.4	95-100
22.4	2564	2822	28.2	71.8	60-80
11.2	2756	5578	55.8	44.2	40-60
4.75	1539	7117	71.2	28.8	25-40
2.36	1184	8301	83.0	17.0	15-30
0.600	389	8690	86.9	13.1	8-22
0.075	620	9310	93.1	6.9	0-8

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date : 28.07.2018

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

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Name of Work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Date of Testing : 28.07.2018

Material Type : Wet Mix Macadam

Oven Dry Wt (gm): **10000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	275	275	2.8	97.3	95-100
22.4	2535	2810	28.1	71.9	60-80
11.2	2780	5590	55.9	44.1	40-60
4.75	1545	7135	71.4	28.7	25-40
2.36	1189	8324	83.2	16.8	15-30
0.600	385	8709	87.1	12.9	8-22
0.075	620	9329	93.3	6.7	0-8

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Ref No.: CQCE/BBMP/BBU/QC/2018-19 **Date:** 28.07.2018

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	**Sri. B.B. Umesh,** Contractor, Bangalore.
Name of the Work	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Type of Mix	Wet Mix Macadam
Date of Testing	28.07.2018

Sl No.	Details	Trial No.			Average
		1	2	3	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	388	390	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	90	92	94	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	296	296	296	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	23.32	23.71	24.10	**23.71**

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CQCE/BBMP/BBU/QC/2018-19 28.07.2018

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	**Sri. B.B. Umesh,** Contractor, Bangalore.
Name of Work	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Sample ID	WMM Layer
Date of Testing	28.07.2018

Result : Flakiness Index = **12.36%**

Elongation Index = **14.51%**

Result : Combined Flakiness & Elongation index 26.87%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CQCE/BBMP/BBU/QC/2018-19

28.07.2018

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	**Sri. B.B. Umesh,** Contractor, Bangalore.
Name of Work	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Sample ID	WMM Layer
Date of Testing	28.07.2018

Result : Flakiness Index = **13.25%**

Elongation Index = **14.89%**

Result : Combined Flakiness & Elongation index **28.14%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CQCE/BBMP/BBU/QC/2018-19

Date : 28.07.2018

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-11

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **Sri. B.B. Umesh,** Contractor, Bangalore.

Name of Work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Date of Testing : 28.07.2018

Material Type : Wet Mix Macadam

As per MORTH Table 400-13

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit	23.50	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CQCE/BBMP/BBU/QC/2018-19

Date : 28.07.2018

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-11

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **Sri. B.B. Umesh,** Contractor, Bangalore.

Name of Work : Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Date of Testing : 28.07.2018

Material Type : Wet Mix Macadam

As per MORTH Table 400-13

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit	22.00	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date : 28.07.2018

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-11

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

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Date of Testing : 28.07.2018

Material Type : Wet Mix Macadam

As per MORTH Table 400-13

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit	23.00	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CQCE/BBMP/BBU/QC/2018-19

Date: 03.08.2018

TEST REPORT

Client	:	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	:	**Sri. B.B. Umesh,** Contractor, Bangalore.
Name of the work	:	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Date of testing	:	03.08.2018

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	64	60 to 70
2	Softening point, ^{0}C	53	Min. 45
3	Ductility at 27^{0}C, cm	100 >	Min. 50
4	Flash Point, ^{0}C	285	Min. 220

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date: 03.08.2018

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	**Sri. B.B. Umesh,** Contractor, Bangalore.
Name of the Work	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	03.08.2018

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	385	386	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	303	303	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	21.30	21.50	**21.40**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

Note:

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Aggregate Impact Value

IS: 2386 Part IV

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Agency	**Sri. B.B. Umesh,** Contractor, Bangalore.
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Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	03.08.2018

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	375	377	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	86	88	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	289	289	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.93	23.34	**23.14**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	03.08.2018

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	381	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	294	294	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.43	22.83	**22.63**

Comments:
→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date: 03.08.2018

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	**Sri. B.B. Umesh,** Contractor, Bangalore.
Name of the Work	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	03.08.2018

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	376	378	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	80	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	296	296	
4	Aggregate Impact value = percent fines			
	100* (W_2/W_1) percent	21.28	21.69	**21.48**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

Note:

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Job No.: CQCE/BBMP/BBU/QC/2018-19

03.08.2018

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	**Sri. B.B. Umesh,** Contractor, Bangalore.
Name of Work	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Bituminous Concrete
Date of Testing	03.08.2018

Result : Flakiness Index = **11.83%**

Elongation Index = **13.76%**

Result : Combined Flakiness & Elongation index **25.59%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

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Job No.: CQCE/BBMP/BBU/QC/2018-19

03.08.2018

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	**Sri. B.B. Umesh,** Contractor, Bangalore.
Name of Work	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Bituminous Concrete
Date of Testing	03.08.2018

Result : Flakiness Index = **11.42%**

Elongation Index = **14.41%**

Result : Combined Flakiness & Elongation index **25.83%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

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Job No.: CQCE/BBMP/BBU/QC/2018-19

03.08.2018

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	**Sri. B.B. Umesh,** Contractor, Bangalore.
Name of the Work	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Type of Mix	Bituminous Concrete
Date of Testing	03.08.2018

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2019	2013	2021	
2	Weight of basket suspended in water	W_2 g	754	756	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1265	1257	1266	
4	Weight of saturated surface dry aggregate in air	W_3 g	2016	2017	2015	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	752	755	754	
6	Weight of oven dried aggregate	W_4 g	2007	2009	2006	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.672	2.643	2.678	2.665
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.705	2.672	2.711	2.696
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.45%	0.40%	0.45%	0.43%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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Job No.: CQCE/BBMP/BBU/QC/2018-19 04.08.2018

Aggregate Gradation Test

IS : 2386 Part I

Client	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	**Sri. B.B. Umesh,** Contractor, Bangalore.
Name of theWork	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	04.08.2018

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	523	10.46	10.46	89.54	79 - 100	
9.5	475	9.50	19.96	80.04	70 - 88	
4.75	715	14.30	34.26	65.74	53 - 71	
2.36	532	10.64	44.90	55.10	42 - 58	
1.18	495	9.90	54.80	45.20	34 - 48	
0.600	632	12.64	67.44	32.56	26 - 38	
0.300	528	10.56	78.00	22.00	18 - 28	
0.150	415	8.30	86.30	13.70	12 - 20	
0.075	419	8.38	94.68	5.32	4 - 10	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	602	12.04	12.04	87.96	79 - 100	
9.5	433	8.66	20.70	79.30	70 - 88	
4.75	763	15.26	35.96	64.04	53 - 71	
2.36	584	11.68	47.64	52.36	42 - 58	
1.18	533	10.66	58.30	41.70	34 - 48	
0.600	642	12.84	71.14	28.86	26 - 38	
0.300	485	9.70	80.84	19.16	18 - 28	
0.150	305	6.10	86.94	13.06	12 - 20	
0.075	325	6.50	93.44	6.56	4 - 10	

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Job No.: CQCE/BBMP/BBU/QC/2018-19 Date: 04.08.2018

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	:	**Sri. B.B. Umesh,** Contractor, Bangalore.
Name of the Work	:	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	04.08.2018

The results of the tests conducted on the bituminous concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.46	10.75	9 Kn (min)
2	Marshal flow, mm	3.25	3.28	2 – 4
3	Percent air voids in Mineral Aggregate	13.12	14.26	13 – 15
4	Voids in Compacted Mix	4.53	5.72	3 – 6
5	Percent Voids filled with Bitumen	73.25	72.54	65 - 75
6	Density, g/cc	2.26	2.27	--

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Date: 04.08.2018

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	:	**Sri. B.B. Umesh,** Contractor, Bangalore.
Name of the Work	:	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	04.08.2018

The results of the tests conducted on the bituminous concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.52	10.82	9 Kn (min)
2	Marshal flow, mm	3.46	3.31	2 – 4
3	Percent air voids in Mineral Aggregate	13.58	14.76	13 – 15
4	Voids in Compacted Mix	4.35	5.68	3 – 6
5	Percent Voids filled with Bitumen	72.82	73.91	65 - 75
6	Density, g/cc	2.26	2.27	--

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Job No.: CQCE/BBMP/BBU/QC/2018-19 04.08.2018

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

CLIENT	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
AGENCY	**Sri. B.B. Umesh,** Contractor, Bangalore.
NAME OF THE WORK	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
DATE OF TESTING	04.08.2018

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	469.5	469
3. Weight of Asphalt and Mineral matter Extracted, g	30.5	31
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	30.5	31
7. Bitumen content in %	6.10	6.20
8. Average	**6.15**	

GRADATION AFTER EXTRACTION

TABLE - 1

SIEVE SIZE	Percent Passing, %		JOBMIX
mm	Sample 1	Sample 2	Gradation
19	100.0	100.0	100
13.2	95.6	87.3	79-100
9.5	83.4	76.5	70-88
4.75	68.9	63.4	53-71
2.36	52.1	46.3	42-58
1.18	37.8	37.8	34-48
0.6	26.4	31.2	26-38
0.3	25.8	26.5	18-28
0.15	17.9	15.2	12-20
0.075	8.2	4.6	4-10

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

CLIENT	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
AGENCY	**Sri. B.B. Umesh,** Contractor, Bangalore.
NAME OF THE WORK	Package 3 Improvements to roads and drains Providing Ammenities Construction of RO water plant Bangaluru one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura Division as per annexure go no udd 217 SFC 2016 Dated 28 5 2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
DATE OF TESTING	04.08.2018

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	469	470.5
3. Weight of Asphalt and Mineral matter Extracted, g	31	29.5
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	31	29.5
7. Bitumen content in %	6.20	5.90
8. Average	6.05	

GRADATION AFTER EXTRACTION

TABLE - 1

SIEVE SIZE	Percent Passing, %		JOBMIX
mm	Sample 1	Sample 2	Gradation
19	100.0	100.0	100
13.2	92.1	86.5	79-100
9.5	81.3	76.4	70-88
4.75	54.2	65.3	53-71
2.36	49.4	48.9	42-58
1.18	41.2	43.5	34-48
0.6	29.6	31.3	26-38
0.3	25.6	24.6	18-28
0.15	13.3	17.9	12-20
0.075	8.7	6.8	4-10

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